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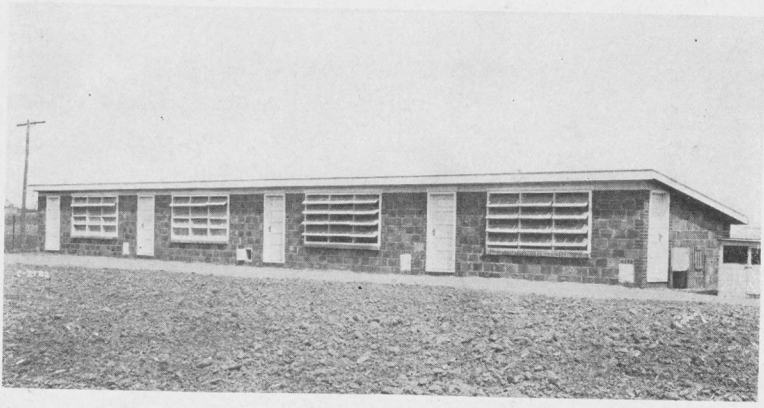
A SUCCESSFUL IOWA SHED ROOF POULTRY HOUSE



Permanent Shed Roof Poultry House at the Iowa State College Poultry Farm.

AGRICULTURAL EXPERIMENT STATION
IOWA STATE COLLEGE OF AGRICULTURE
AND MECHANIC ARTS

ANIMAL HUSBANDRY
Poultry Husbandry Section

AGRICULTURAL ENGINEERING
SECTION

AMES, IOWA

A SUCCESSFUL IOWA SHED ROOF POULTRY HOUSE.

By Geo. M. Turpin and M. F. P. Costelloe.

After putting it to practical test on the Iowa State College poultry farm, the Iowa Agricultural Experiment Station recommends the permanent shed roof poultry house described in this bulletin. This house was planned and built by the Poultry and Agricultural Engineering sections of the station for housing 75 or more laying hens kept under Iowa conditions. It has given good results in practical use at the poultry farm and on this basis it is recommended to those who have need of a poultry house of this type.

This house was planned to meet all the essential requirements of a successful poultry house. Such a house must provide the fowls with adequate protection from bad weather, including both excessive cold and heat, as well as cold winds, rain and snow. It must also provide suitable roosting quarters, a place for the hens to lay and a suitable place to feed the stock, particularly in bad weather. It should also be planned to furnish more or less protection from vermin and parasites.

In supplying these requirements, it is important that care be taken not to impose upon the stock conditions which are detrimental to their health, comfort and productiveness. There must be provision for plenty of light, ventilation and dryness. Cracks and crevices that harbor parasites and disease germs must be done away with for parasites and disease all too often become the most serious menace to successful poultry keeping. The cost of the house, both from the standpoint of first cost and up-keep, and the facility and speed with which the poultry keeper can do the necessary work in the care and management of the stock are also important considerations. Finally the general appearance of the building in connection with the surroundings should be attractive.

Because of the differences in the climate and in the availability and cost of the various kinds of building materials in different sections of the country it is not possible to plan a poultry house that is ideal for all sections and because of differences in the needs and conditions of individual poultry keepers the same point will hold true to a less extent for the different poultry keepers of any one particular section.

GENERAL FEATURES.

The house is built with hollow tile walls, shed roof and cement floor.

The detail plans and bill of material as given provide for two pens each 20 feet long and 14 feet wide, but the size of the structure may be reduced to one such pen or increased to four or five to accommodate from 75 to 400 or 500 hens, as desired.

Each pen has a capacity of from 75 to 100 hens which allows from 2.8 to 3.7 square feet of floor space per hen. Three roosts at the back of each pen and a row of 16 nests in the front space directly beneath the dropping board provide an average of from 7 to 9 inches of roost space per hen and one next for each five or six hens. If the stock is to be kept confined to the house through a considerable part of the year, an increase in the width of the house to 16 feet is advisable in order to increase the floor space to 4 square feet per hen. An increase in the width of the house with a corresponding increase in the number of hens, however, is not recommended because there would then be too little roosting space, particularly during warm weather, and also too few nests to accommodate properly the larger flock. The use of more than three roost poles and a corresponding increase in the width of the dropping board is also undesirable. This

makes an inaccessible space on the floor beneath which encourages the hens to lay on the floor and makes the proper management of the stock otherwise more difficult.

The dimensions given permit the light from the openings in front to extend well back to the rear without having the front wall otherwise unnecessarily high.

One of the important and special features of this house is the arrangement of the windows, which open on pivoted hinges and provide for ventilation between the sash. These are hung so that they overlap and effectively shut out rain or snow while at the same time they permit the indirect entrance of an abundance of fresh air. Each of the sash members is equipped with a common spring window catch which works in a series of holes in the window frame, permitting the window to be set at different angles to meet different climatic conditions. This system of lighting and ventilating the house thru the same opening permits the use of a larger amount of solid, well-insulated wall at the front of the building so that it is made warmer in winter than otherwise. Moreover, because this system keeps out rain and snow, it can be adjusted for the average conditions of the season and constant attention and frequent adjustments can be dispensed with.

To provide additional ventilation and to keep the house cool in summer the lookouts on the rafters at the rear of the building are boxed in with a small hinged door. This should be kept tightly closed during other seasons to prevent cold draughts. The windows on the front, on the other hand, should never be entirely closed or excessive dampness in the house will result.

The importance of ventilation in keeping the poultry house dry is not generally appreciated or understood. It has been found that an average hen breathes off over 40 cubic feet of air per day and that this air is practically saturated with water at the temperature of the hen's body. One hundred hens breathe from their lungs over 1½ gallons of water per day, which is sufficient, if perfectly dry air were used for ventilating, to saturate the air completely in one of the pens described in this bulletin every three-quarters of an hour when the temperature is at the freezing point. As the outside air usually contains half enough moisture in cold weather to saturate it, twice the amount of ventilation stated is required under practical conditions to prevent condensation and consequent dampness. It is on this account that hens cannot be closely confined to separate roosting compartments, without disastrous results from poultry diseases such as colds, catarrh and roup.

Many poultry houses are built unnecessarily high. It is undesirable both from the standpoint of cost and the comfort and welfare of the stock to build the house higher than is necessary for the convenience of the attendant. The height given will, therefore, be found to be adequate.

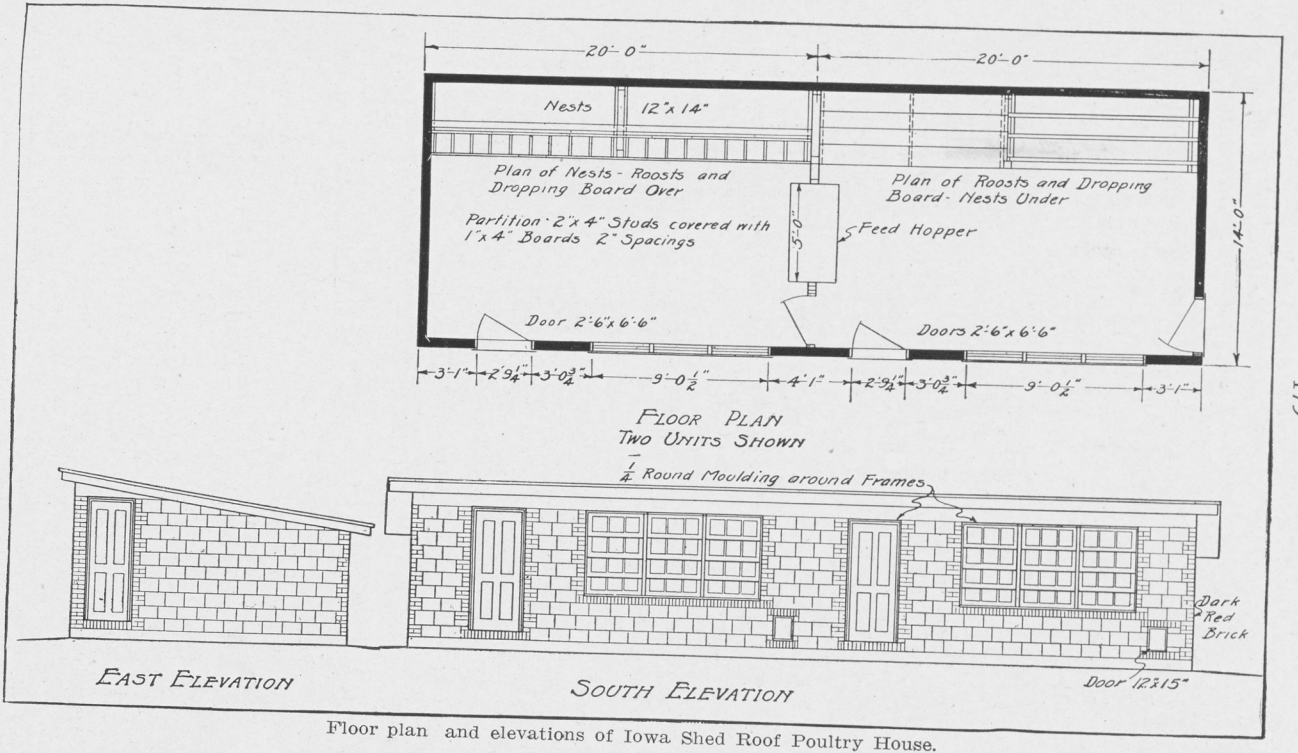
DETAILS OF CONSTRUCTION.

Foundation. The foundation is made of concrete consisting of a mixture of 1 part Portland cement, 2 parts clean coarse sand and 4 parts broken stone or screened gravel. A natural mixture of sand and gravel may be used in the proportion of 1 part cement and 4 parts gravel, where the particles larger than ¼ inch are twice the volume of the finer material. The foundation extends 1 foot below the ground level and six inches above. It is made 12 inches wide below grade and 8 inches above. If the drainage is not good a tile drain should be placed around the foundation near the base.

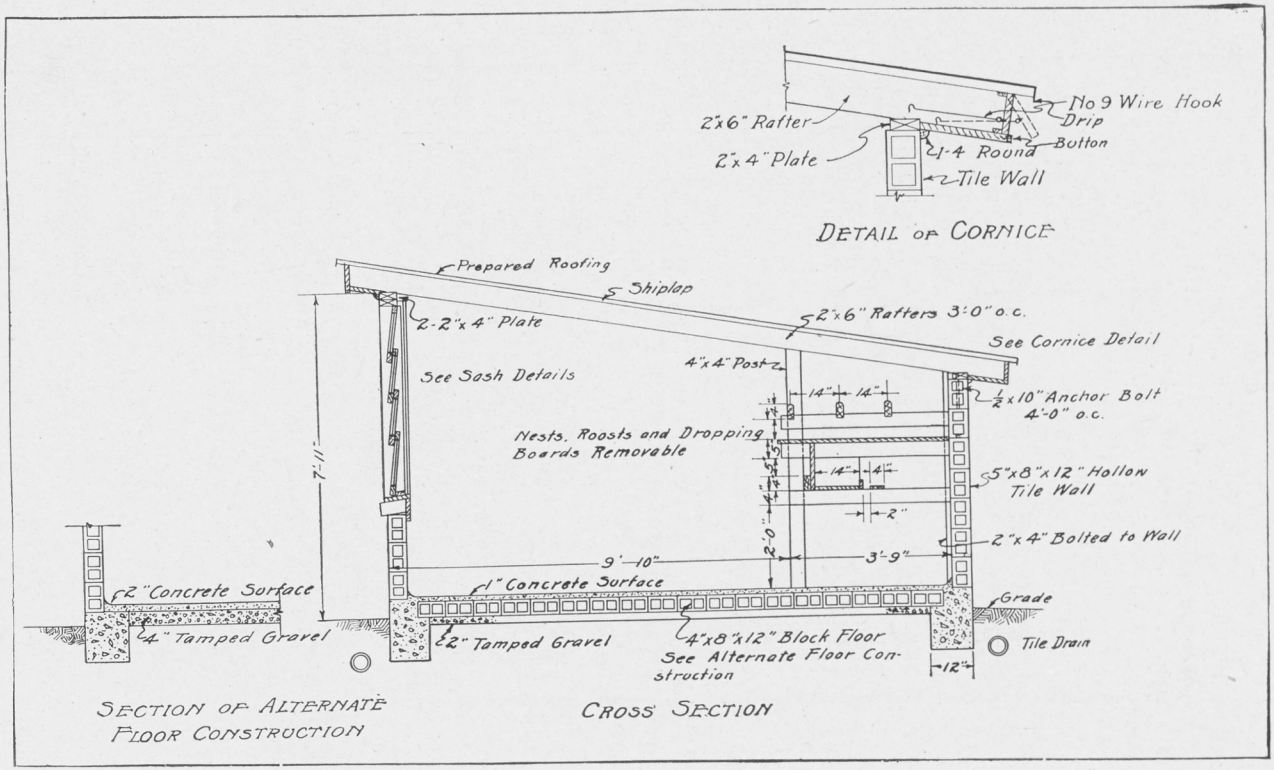
Floor. The floor should be underlaid with at least four inches of well-tamped cinders or preferably coarse gravel and sand or with a layer of clay blocks over a 2-inch layer of well-tamped gravel. The latter construction is somewhat more expensive than the other but it is a better prevention against the rise of moisture thru the floor. If tile are used they are covered with a one-inch layer of concrete mixed in the proportion of 1 part cement to 3 parts sand and gravel which passes a ½-inch mesh screen. If concrete is used over a cinder or gravel base it is made 2 inches thick and is mixed in the proportions 1 part cement to 3 parts sand and gravel which will pass a ¾-inch mesh screen. In all cases the surface of the floor should be carefully finished smooth with a steel trowel.

Walls. The walls are made of 5″x8″x12″ hollow tile, the tile being laid so as to make a wall 5″ thick. The tile is laid in a cement mortar made of one part well slaked or hydrated lime, 2 parts cement and 4 parts clean well-screened sand. The horizontal mortar joints should not exceed ⅝″ in thickness and all joints should be pointed on both the inside and outside. In the plans as given here, all corners, jam blocks and sills for doors and windows are of dark red common brick laid as shown in the drawings. However, special tile may be used for the corners and jams if desired, with a saving in cost. The inside joint between the floor and wall should be rounded with cement concrete when the floor is laid in order to facilitate cleaning the floor.

Openings. All door frames should rest on sills made at least 6 inches high so that the litter used to cover the floor will be



Floor plan and elevations of Iowa Shed Roof Poultry House.

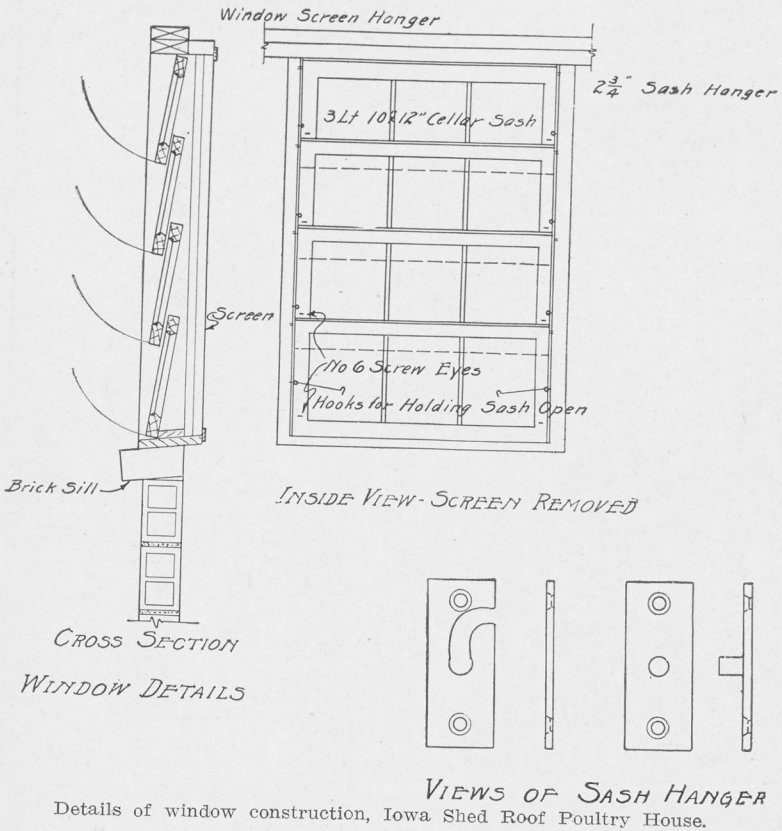


Details of foundation, floor and interior construction, Iowa Shed Roof Poultry House.

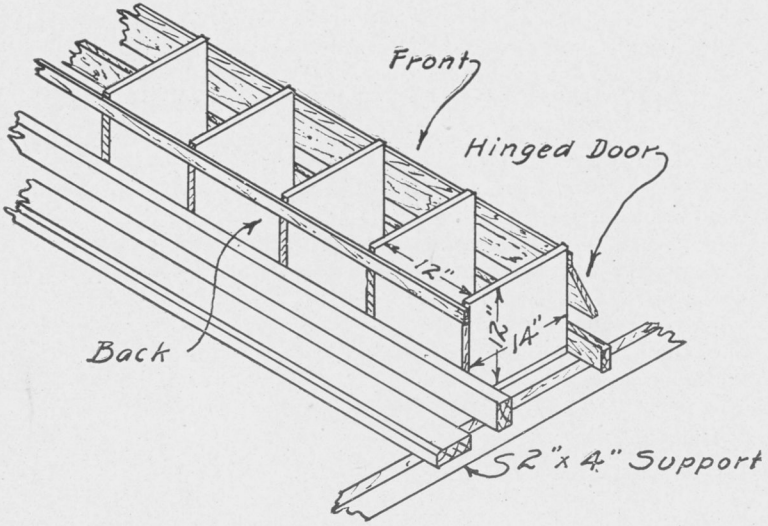
retained and the doors opening toward the inside will move freely over it. Basement sash of the size indicated in the drawings and bill of materials are used for the windows. When the sashes are opened up as much as desirable for summer it is necessary to use screens over the inside of the window frames to prevent the fowls from flying up on them. The screens are made of one-inch mesh poultry netting so that they are also useful in keeping out sparrows.

Roof. Rafters 2″x6″ placed 3 feet apart furnish ample support for the roof. These are covered with shiplap and a good grade of roofing paper.

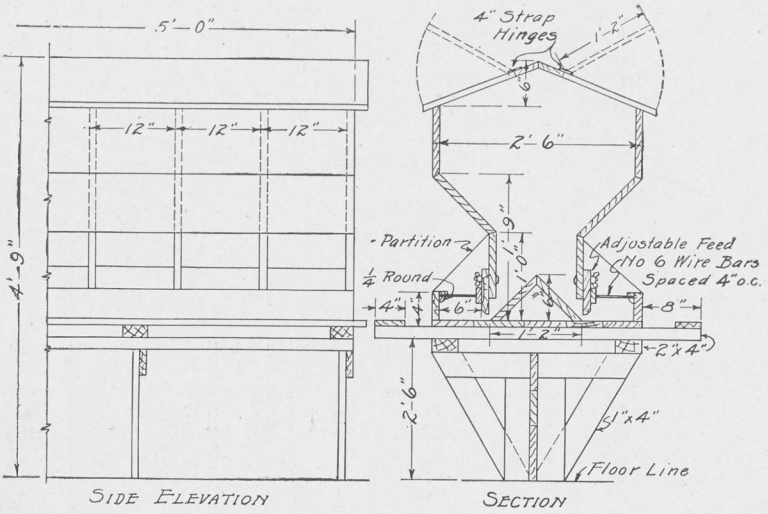
Fixtures. In addition to the roosts, nests and dry mash hopper shown in the plan it is advisable to provide a grain supply box large enough to hold at least 100 lbs. of scratch food. This amount will be sufficient to feed 100 hens for about a week.



Details of window construction, Iowa Shed Roof Poultry House.



Type of Nest Used Under Dropping Board



Details construction of nest, above, and of food hopper, below.

BILL OF MATERIALS FOR POULTRY HOUSE.

2 Units.

MASONRY.

Foundation—

5⅓ cu. yds. 1:2:4 concrete
Requiring:
34 bags cement
2½ cu. yds. sand
5 cu. yds. gravel
112 lineal feet 4" tile (plus distance to outlet)

Floor—

1½ cu. yds. concrete 1:3
Requiring:
3¾ bbl., or 15 bags cement
1½ cu. yds. sand and gravel
761 tile 4"x8"x12"
3 cu. yds. gravel-fill

Alternate Floor—

6 cu. yds. gravel-fill
3 cu. yds. concrete 1:3
Requiring:
29 bags cement
3 cu. yds. gravel-fill

Walls—

720 tile 5"x8"x12"
425 brick

Mortar—

8 bu. lime, or 640 lbs.
10 bags cement
1⅓ cu yds. sand

LUMBER.

Roof—

Rafters—16 pieces 2"x6"x16"
Plates—9 pieces 2"x4"x14'
Sheathing—700 surface feet or 750 ft. B. M. 8-inch shiplap
Roofing—7 rolls, including nails and cement.

2 doors 1-⅜"x2'6"x6'6"
2 doors 1-⅜"x4" rabbitted jambs—door frames
24 sash 1⅜"x16"x34" (cellar)
2 sash frames—Triple 12 sash each frame 1-⅜" jamb (See elevation)
2 doors 12"x15" batten
2 frames for 12"x15" doors

Partition—

2 pieces 2"x4"x14' studs
100 lineal ft. 1"x 4" S 4 S

Cornice—

84 lineal ft. 1″x12″ boards S 4 S
84 lineal ft. 1″x 8″ boards S 4 S
84 lineal ft. 1″x 6″ boards S 4 S

Dropping Boards—

16 pieces 1″x12″x10′ boards S 4 S

Roost Supports—

3 pieces 4″x 4″x 6′0″ S 4 S
4 pieces 2″x 4″x12′0″ S 4 S
5 pieces 2″x 4″x16′0″ S 4 S

Nests—

4 pieces 1″x14″x10′0″
4 pieces 1″x12″x12′0″
8 pieces 1″x 2″x10′0″
4 pieces 1″x 8″x10′0″

Moulding—180 lineal ft. ¾″ one-quarter round
120 lineal ft. ⅝″x1⅛″

HARDWARE.

2 pounds 20 d nails
3 pounds 8 d nails
5 pounds 7 d nails
3 pounds 4 d nails
¾ gross No. 6 screw eyes
4 locks complete
4 pair 3″x3″ butts—door hinges
26 lineal feet poultry netting 1″ mesh 36″ width
2 pair T-hinges 3″ for small doors
2 screen door hooks complete
60 lineal feet No. 9 galvanized wire for hooks used in adjusting sash

FEED HOPPER.

1 piece 2″x 4″x12′0″ material all S 4 S
1 piece 2″x 4″x10′0″
3 pieces 1″x10″x10′0″
1 piece 1″x14″x12′0″
2 pieces 1″x 4″x10′0″
1 piece 1″x 4″x12′0″
2 pieces 1″x 4″x 8′0″
1 piece 1″x12″x10′0″
2 pieces 1″x 8″x10′0″
1 piece 1″x 6″x10′0″
10 lineal feet one-quarter round
10 lineal feet ⅜″x1″ S 4 S
10 lineal feet ¾″x2″ S 4 S
2 pair 4″ strap hinges with screws
12 lineal feet No. 6 galvanized wire